

**Claims**

1           1.     A gas assist mold dump valve positioned between a gas controller  
2     and a mold cavity comprising:

3                 a pressure regulator, said regulator comprising:

4                     a body having a gas inlet in fluid communication with a gas  
5     controller and a gas outlet in fluid communication with the mold cavity;

6                     a vent formed in said body between said gas inlet and said gas  
7     outlet; and

8                     a piston slidably mounted for reciprocal motion within said body,  
9     said piston being movable between a first position to close said vent and a second  
10    position to open said vent;

11                    a check valve in fluid communication with said inlet and said outlet, said  
12    check valve having a open position to allow gas to flow from the inlet to the outlet  
13    and a closed position to close the flow gas from the outlet to the inlet;

14                    whereby gas entering the inlet urges said piston toward a first position,  
15    passes through the check valve into the outlet and enters said mold cavity and gas  
16    exiting the mold cavity urges the piston toward said second position to open the  
17    vent and expel the gas.

1           2.     The valve of claim 1 wherein said piston is calibrated to have a  
2     greater than 1:1 dome-to-seat area ratio.

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- 1            3.     The valve of claim 1, further comprising a connector, said
- 2     connector fluidly communicating said check valve with said gas outlet.